

# Observation of turbidite sandstone using X-ray CT for grasping a relationship between internal structure and partial permeability

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The X-ray CT observations, grain distribution analysis and porosity measurement of sediments were done to grasp fluid migration and/or transportation of turbidite sandstone, and discussed. Origin of many sediments exposed near slopes are the turbidites, which sediments have structural features that can be seen within core samples taken from Nankai-trough by X-ray CT. The sedimental structure of turbidite is very famous and common, and also the pixel brightness change can be observed from bottom to top as gradation, while there were invisible structure and higher brightness in case of hemi-pelagic mudstones. When X-ray absorption has a liner relationship with density, without considering element difference, each difference of brightness is as 10% of full scale brightness, which is as same as 0.2 g/cm<sup>3</sup> density change. The results of grain distribution analysis and porosity measurement of sediments, coarse layers at bottom includes some amount of fine grain/clay and they have low porosity were presented. Hence, middle laminated layers were very well sorting without fine particles. These internal features of turbidite structure imply that each part of physical properties will be different, especially for permeability. The results of permeability measurements, the permeability of coarse bottom layer is  $1e-15[m^2] = 1mDarcy$ , which was quite low permeability for sandy sediment. This value is almost same as that of muddy-clay layer of top, which is  $6e-16[m^2] = 0.6mDarcy$ . It means that sandstone is not always good for fluid migration/transportation. Based on these measurements and results, the fluid migration/transportation/accumulation will be discussed on sand-mud alternated layers.

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